

REMARKS

Claims 1 through 11 are present in the case.

Referring to Paras 1, 4 and 5 of the Office Action, as the referenced claims are all original claims, and thus form a part of the original Specification, their substance has been incorporated into the main body of the Specification. The substance of the referenced claims now appears in the underlined passages of the corrected Specification, presented herewith. The superfluous periods associated with claims 3 and 9 have been deleted; however claims 3 & 9 per se have not been amended, and are in their original state.

On Page 1, the prior art AquaLuminator (T.M.) is now more fully and correctly identified.

The present lighting system utilizes a submerged light fixture forming an integral part of, but located externally of the water circulation system, thereby maintaining the water return line independent from the light fixture. As a consequence, the adjustment, servicing and maintenance of both the light and the return water flow outlet are substantially independent of each other.

In the case of both Vajda et al (US 5,207,499) and Ruthenberg (US 6,184,628), these references both show integral light and circulation fittings, wherein the light fitting is positioned interiorly of the circulation fitting, such that the return circulation flow of water envelopes and flows around the light fitting.

As brought out in the Declaration by the present Inventor, presented herewith, maintenance, servicing and adjustment of either the light or the water circulation portion of these prior systems impinges upon the function of the other portion of the system.

The side-by-side arrangement of the present light fixture/ return nozzle arrangement permits of a range of relative positioning of the light fixture portion about the axis of the water return line, by rotational repositioning about the polar axis of the water access fixture portion, whereas the

coaxial light/discharge fitting arrangements of Vajda et al and Ruthenberg appear to be incapable of any such variation.

Turning to certain of the Examiner's comments, in rejecting claims 4 and 5, the alleged "new matter" forms part of the original claims, and is therefore properly identified as being a part of the original Specification. It is respectfully submitted that this does not constitute new matter.

The matter of the depth to diameter ratio of the subject light housing, as set forth in claim 4 is at total variance with the Vajda et al arrangement. In the case of the present invention, the attached light housing "sits" against the surface of the pool wall, and stands out from that surface, such that it is highly desirable to make the housing as streamlined and slender as possible, so as to minimize its protrusion from the pool wall. Hence the significance and importance of the depth/diameter ratio. For the Vajda et al and Ruthenberg lamp fittings, which are both located within the water fitting, this requirement for slenderness (minimal depth) clearly does not apply, as is clearly evidenced by the respective drawings of the two cited patents.

It is respectfully submitted that the amended independent claims 1 and 7 are fully supported in the original Specification, and distinguish patentably over the cited Vajda et al and Ruthenberg references, taken singly or in combination. The balance of the claims, taken with the claims from which they depend, define new and patentable combinations

Consideration of the claims with a view to their allowance is requested.

Respectfully submitted.


Douglas W. Eggins Patent Agent
Regn.No. 21,175

SWIMMING POOL IMMERSED LIGHT FIXTURE

Cross-Reference To Related Applications -NOT APPLICABLE (N/A)

Statement Regarding Federally Sponsored Research Or Development - N/A

Reference To A Sequence Listing, A Table, Or A Computer Program Listing -N/A

Compact Disc Appendix - N/A

Background Of The Invention

1. This invention is directed to an underwater lighting system for use with swimming pools, and to a light fixture particularly suited for use with above-ground pools.

2. An earlier form of immersed light, as marketed in the United States by Pentair Pool Products under the name "AquaLuminator" (Trademark), (U.S.Patent # 5,207,499), consists of a light fitting that is located in the wall of a pool, within and centrally of the water inlet.

The Pentair fitting has a divergent flow diffuser, to divert inflowing water around the outside of the light fitting. This arrangement serves as a significant restriction to the free flow of water entering the pool from the pump/filter circulation system, with a marked increase in back-pressure and consequent undesirable changes in the operating characteristics of that system.

Brief Summary of the Invention

The present invention provides a submerged pool lighting system, with a light fitting that forms part of and is integrally combined with a pool service water connection.

The subject light fitting is combined with a circulation fitting such as the pool circulation water return fitting.

In a preferred system embodiment having a water access fixture for installation through an aperture in a wall of a pool, the access fixture has a light assembly integrally

connected in adjacent relation with, and externally of the access fixture; the light assembly having a housing with a translucent cover; and power supply means connecting with the light assembly and extending through the access fixture, for connection to an externally located power source.

Thus, the subject light fitting is located in unitary adjoined relation with a pool circulation fitting, to provide a slender, flush-fitting light source immediately adjacent to, and in substantially non-obstructing relation with a circulation fitting such that the flow characteristics of the pool circulation system are substantially unchanged.

In a preferred embodiment, the subject light assembly housing is of shallow depth, having a diameter/depth ratio greater than two.

In the preferred embodiment for an above-ground pool, the combined circulation/light fitting of the present invention incorporates a flow access fixture through the pool wall for the location of a connecting power cord, by which the light fitting is energized.

In that embodiment of pool lighting system, the power cord connecting the light assembly with the power source, includes a free length of that cord located within the housing, to facilitate ready outward withdrawal of the sealed light assembly from the housing.

The water access fixture includes an electrical access conduit extending along a portion of the length of the fixture, which conduit accommodates the connecting power cord.

The water access fixture has an externally threaded pipe portion with a locking nut in threaded engagement thereon for securing the access fixture to the pool wall.

The light source for the subject system comprises a shallow, substantially planar, circular array of light emitting diodes (LED's), powered by way of a step-down transformer from a domestic supply, by way of a ground-fault circuit breaker for

purposes of electrical safety.

The light emitting diodes may have a light colour emission selected from the group consisting of red, green and blue LED's, being mounted on a printed circuit board [[.]]
, the LED array being releasably secured by attachment means within the sealed assembly.

The use of red-green-blue LED's enables the use of a programmed system to provide selected colour outputs, ranging over a wide colour spectrum.

In one embodiment of the present invention the light emitting diodes have a light colour emission selected from the group consisting of red, green and blue.

The use of an alternative light source such as a halogen light bulb is contemplated. This fits within the slender profile of the present light housing portion of the combined circulation fitting/pool light; also, a low voltage 12-volt supply circuit can be used.

Brief Description of the Several Views Of The Drawings

Certain embodiments of the present invention are described by way of illustration, without limitation of the scope of the invention thereto, other than as set forth in the present claims, reference being made to the accompanying drawings, wherein:

Figure 1 is a front elevation of a pool light fitting embodiment in accordance with the present invention;;

Figure 2 is a side elevation view in section, showing a wall portion of an above-ground swimming pool with the subject combined light fitting/circulation fitting in schematic, diametrical section; and,

Figure 3 is a side elevation view of a second embodiment, illustrated at a reduced scale;

Detailed Description of the Invention

Referring to Figures 1 and 2, a combined light fitting/circulation fitting 10 in accordance with the present invention has a flanged circulation fitting 12 with a water inlet portion 16 for connection through the steel wall 18 of a pool. An annular "eyeball" directional nozzle is secured in the outlet of the fitting 12 by way of a threaded retaining ring 14.

The inlet portion 16 enables the attachment of a water line connection (not shown) to a filter and circulation pump (also not shown), by which the pool water is circulated and cleaned.

A light fitting portion 20 is integrally connected to the flange portion of the fitting 12, which includes two connecting web portions 22.

The light fitting portion 20 has a cylindrical body 24, containing an array of LED lights 26 mounted on a printed circuit board 28. An epoxy seal serves to waterproof the circuitry, enabling its submergence.

A connected power cord 30 includes spare turns of the cord 30 wound about a conical housing 32, to enable withdrawal of the light array 26 from the light fitting portion 20.

The power cord 30 extends through the flange portion 12 and a connection conduit 34 that forms a part of the water inlet portion 16, the conduit exiting at 36.

The power cord 30 is connected with a step-down transformer/rectifier 38 to provide a 12-volt D.C. output. For safety purposes, the power supply is obtained through an electrical outlet (not shown) equipped with a Ground Fault Circuit Breaker.

The light fitting portion 20 has an outwardly convex translucent lens 40 mounted on an annular gasket 42, and secured by screws 44.

The assembled LED array 26, with board 28 and lens 40 is secured within the body 24

by way of detent 48 which engages behind rib 58. A screw 60 secures the LED/lens array in place.

The inlet portion 16 projects through an aperture in the pool liner 50 and pool wall 18, being secured in place by a backing nut 52 screwed to the threaded inlet portion 16, (the nut 52 being shown partially screwed home).

The nut 52 serves to sandwich and locally compress the pool liner 50 and an annular sealing gasket 54 into sealing engagement between the flange portion 12 and the pool wall 18.

If maintenance or replacement of the LED array 26 is required, this may be carried out without drain-down of the pool water. Removal of the screw 60 and disengagement of detent 48 permits the light array 26/28/40 to be removed from the housing portion 20.

The spare turns of the cord 30 permit withdrawal of the light array above water, for servicing or replacement purposes.

A readily compressible foam gasket 46 adhered to the back of the light body portion 24 abuts the pool liner 50, serving to stabilize the installation.

In the Figure 3 embodiment, the side profile of the combined light fitting/circulation fitting 10' is unified, having a smooth curved profile with minimal protruberances, and affording substantially no hand-holds or foot-holds to users of the pool.

It is contemplated that the power cord 30 may project into the interior of the water inlet portion 16, without recourse to a connection conduit 34.

Claims

- 1.(currently amended) A submerged pool lighting system for use with a pool having a water circulation system, said lighting system including a water access fixture for installation through an aperture in a wall of the pool, said access fixture having at least one water discharge aperture encompassing a predetermined frontal area, said fixture having a light assembly portion integrally connected in adjacent relation with and located externally of said discharge frontal area ~~said access fixture~~; said light assembly portion having a housing with a translucent cover; and power supply means connecting with said light assembly and extending through said access fixture, for connection to an externally located power source.
2. (original) The pool lighting system as set forth in Claim 1, wherein said light assembly contains a substantially planar array of light-emitting diodes.
3. (original) The pool lighting system as set forth in Claim 1, wherein said water access fixture includes an electrical access conduit extending along a portion of the length of the fixture.
- 4.(currently amended) The pool lighting system as set forth in Claim 1, wherein said light assembly portion housing is of shallow depth, having a diameter/depth ratio greater than two.
- 5 (original) The pool lighting system as set forth in Claim 2, wherein said light emitting diodes have a light colour emission selected from the group consisting of red, green and blue.
6. (original) The pool lighting system as set forth in Claim 1, wherein said power source is a low-voltage power source.
- 7.(currently amended) A pool lighting system for use with an above-ground pool having a water circulation system, said lighting system including a water access fixture portion for

installation through an aperture in a wall of the pool, having an externally threaded pipe portion with a locking nut in threaded engagement thereon for securing said access fixture to said pool; said access fixture having a light assembly portion integrally connected in adjoined, externally attached ~~depending~~ relation therewith; said light assembly portion having a housing with a translucent cover; and power supply means connecting with said light assembly and extending through said access fixture, for connection to an externally located power source.

8. (original) The pool lighting system as set forth in Claim 7, said light assembly portion including a plurality of Light Emitting Diodes in substantially planar array, having said translucent cover in secured relation therewith; and attachment means securing said LED array in releasably secured relation with said light assembly housing.

9. (original) The pool lighting system as set forth in Claim 8, said attachment means including a rib and detent in mutually engaging relation located diametrically opposite a removable screw securing said LED array to said housing.

10 (original) The pool lighting system as set forth in Claim 9, said power supply means including a power cord connecting said light assembly with said power source, including a free length of said cord located within said housing, to facilitate ready outward withdrawal of said LED array from the housing.

11. (original) The pool lighting system as set forth in Claim 7, said integrally connected water access fixture portion and said light assembly portion having a smooth, outwardly convex outer surface in use to afford flush fitting relation with the interior of said pool.